

## CLAIMS

1. A capsule filling-sealing apparatus comprising:

a capsule filling section, having a turntable holding empty capsules and rotating intermittently at intervals of a constant rotation angle, configured to sequentially carry out a separation process for separating the body and the cap of said empty capsule at the stop position of the intermittent rotation of said turntable, a filling process for filling said body with a filling material, a connection process for connecting said body with said cap to form each of filled capsules, and a transfer process for discharging said filled capsules to the next process,

a capsule transfer section for sequentially receiving and holding said filled capsules from said capsule filling section and for transferring said filled capsules while controlling said filled capsules in a desired posture, and

a capsule sealing section having a transfer mechanism for receiving said filled capsules from said capsule transfer section and for transferring them in a substantially horizontal direction, and a sealing mechanism for forming a band seal at the

connection portion of the cap and the body of said filled capsule to form each of sealed capsules, wherein

said capsule filling section, said capsule transfer section and said capsule sealing section are configured integrally so that the production from empty capsules to completed capsules is carried out on the same production line.

2. The capsule filling-sealing apparatus in accordance with claim 1, wherein said capsule filling section is configured in which said empty capsule is separated into a body and a cap, said cap is held in a cap holding disc, said body is held in a body holding disc, and said cap holding disc and said body holding disc rotate intermittently together with the turntable at intervals of a constant rotation angle, and

in the filling operation for filling said body with said filling material, said body held in said body holding disc is raised, and the tip of a nozzle for discharging said filling material is disposed inside said body.

3. The capsule filling-sealing apparatus in accordance with claim 1, wherein said capsule

transfer section comprises a discharge roller for sequentially receiving said filled capsules from said capsule filling section and for holding them, a connection chute having passages for discharging said filled capsules from said discharge roller and for transferring them using compressed air, and a transfer roller for receiving said filled capsules from said connection chute and for controlling said filled capsules in a desired posture.

4. The capsule filling-sealing apparatus in accordance with claim 3, wherein said discharge roller of said capsule transfer section is configured to receive a plurality of filled capsules and defective capsules held in said cap holding disc and to hold them by suction while rotating intermittently, to discharge said filled capsules to the capsule discharge port of said connection chute disposed at a predetermined position in the vicinity of the external circumferential face of said discharge roller, and to feed said defective capsules to a defective capsule discharge port disposed in the vicinity of the external circumferential face of said discharge roller at a position different from said capsule discharge port and to eject said defective capsules outside the

production line.

5. The capsule filling-sealing apparatus in accordance with claim 3, wherein the capsule transfer section is configured in which capsule holding holes are formed on the external circumferential face of said transfer roller, said capsule holding holes are disposed at the position corresponding to the capsule discharge port of said connection chute by virtue of the rotation of said transfer roller, each of said capsule holding holes comprises a horizontal hole being substantially parallel to the center axis of said transfer roller and a vertical hole extending substantially vertically to said center axis at one end of the bottom face of said horizontal hole, said vertical hole has a depth smaller than the longitudinal axial length of said filled capsule, and said filled capsules discharged from said capsule discharge port and accommodated in said vertical holes are guided by a guide plate disposed in the vicinity of the external circumferential face of said transfer roller and accommodated in said horizontal holes.

6. The capsule filling-sealing apparatus in accordance with claim 1, wherein said transfer

mechanism of said capsule sealing section is configured to comprise slats for guiding said filled capsules so as to be movable freely and bottom plates, disposed in the vicinity of the lower faces of said slats, for supporting said filled capsules, in which each of said filled capsules received from said transfer roller makes contact with said bottom plate and rotates on its axis during transfer, and the direction perpendicular to the rotation axis of the rotation on its axis is different from the transfer direction, whereby said filled capsule is moved in one direction and positioned.

7. The capsule filling-sealing apparatus in accordance with claim 1, wherein said capsule sealing section is configured to comprise two sealing mechanisms disposed on the same transfer line, in which a first sealing mechanism applies a sealing liquid to the connection portion of the cap and the body of said filled capsule, and a second sealing mechanism pushes said connection portion in a way adapted for its shape to form a band seal.

8. The capsule filling-sealing apparatus in accordance with claim 7, wherein said first sealing mechanism has a first sealing roller having an

external circumferential face partially dipped in said sealing liquid and making contact with the connection portion of said filled capsule, said second sealing mechanism has a second sealing roller having an external circumferential face partially dipped in said sealing liquid and making contact with said connection portion, the cross-sectional shape of the external circumferential face of said first sealing roller in a direction parallel to the rotation axis thereof has a concave shape, and the cross-sectional shape of the external circumferential face of said second sealing roller in a direction parallel to the rotation axis thereof is a step shape adapted for the shape of said connection portion.

9. The capsule filling-sealing apparatus in accordance with claim 1, wherein a sensor section for inspecting the external appearances of said sealed capsules is disposed at the latter stage of said capsule sealing section and comprises a sensor roller for forcibly rotating said sealed capsules located at the inspection position at a desired rotation speed from the lower face of said transfer mechanism and a line sensor camera for inspecting the sealing states of said connection portions of

said sealed capsules at the detection position to detect defective band seals.

10. The capsule filling-sealing apparatus in accordance with claim 1, further comprising a capsule drying section for receiving said sealed capsules from said capsule sealing section and for drying the band seals of said connection portions.

11. The capsule filling-sealing apparatus in accordance with claim 10, wherein the capsule drying section is configured to comprise an endless capsule transfer mechanism disposed so as to meander vertically while holding said sealed capsules and a blower for blowing air from above and/or sides to said capsule transfer mechanism, in which said capsule transfer mechanism receives said sealed capsules, moves them by a predetermined distance to dry them, and discharges said sealed capsules as completed capsules.

12. The capsule filling-sealing apparatus in accordance with claim 1, wherein said capsule transfer section is configured to comprise a cylindrical cooling section for sequentially receiving said filled capsules from said capsule

filling section and stacking and holding them, a capsule holding block configured to receive said filled capsules from said cooling section, to hold them and to be capable of moving them by a predetermined distance, a transfer section for receiving said filled capsules from said capsule holding block and for discharging said capsules in a desired sequence, and a transfer roller for transferring said filled capsules received sequentially from said transfer section to a transfer mechanism in the later stage while controlling the postures of said filled capsules.

13. The capsule filling-sealing apparatus in accordance with claim 3, wherein an opening communicating with outside air is provided in the vicinity of said capsule discharge port in said connection chute of said capsule transfer section, and said opening is configured to discharge the air flow for capsule transfer, flowing inside said connection chute, to outside air.

14. The capsule filling-sealing apparatus in accordance with claim 3, wherein a crack prevention guide is provided at the portion of delivering said filled capsules from said connection



chute to said transfer roller of said capsule transfer section so that the vicinity of said capsule discharge port of said connection chute is communicated with a vacuum passage provided in said transfer roller.